

Title (en)

CONTROLLING FLAP LOADING ON A WIND TURBINE BLADE BASED ON PREDICTED FLAP LOADING

Title (de)

STEUERUNG DER KLAPPENBELASTUNG AUF EINER WINDTURBINENSCHAUFEL AUF BASIS DER VORHERGESAGTEN KLAPPENBELASTUNG

Title (fr)

COMMANDE DE CHARGEMENT DE VOLET SUR UNE PALE D'ÉOLIENNE SUR LA BASE DU CHARGEMENT DE VOLET PRÉVU

Publication

**EP 3744973 B1 20231004 (EN)**

Application

**EP 19177617 A 20190531**

Priority

EP 19177617 A 20190531

Abstract (en)

[origin: EP3744973A1] The present invention provides a method of controlling loading on a wind turbine blade in the flap-wise direction. The method includes defining a system model that has a description of flap loading on the blade, and predicting flap loading on the blade over a prediction horizon using the system model. The method includes determining a dynamic flap loading limit based on predicted flap loading and a measured flap loading, and defining a constraint to limit flap loading on the blade based on the dynamic flap loading limit. The method includes using the predicted flap loading in a cost or performance function, and optimising the cost function subject to the constraint to determine pitch for the blade to control flap loading on the blade. Advantageously, the dynamic limit varies based on discrepancies between predicted and measured flap loading to allow for adaptive back-off from extreme loads prior to such loads building up or being exceeded.

IPC 8 full level

**F03D 7/02** (2006.01); **F03D 7/04** (2006.01)

CPC (source: EP US)

**F03D 1/06** (2013.01 - US); **F03D 7/02** (2013.01 - US); **F03D 7/0224** (2013.01 - US); **F03D 7/0232** (2013.01 - EP); **F03D 7/0256** (2013.01 - US); **F03D 7/0296** (2013.01 - US); **F03D 7/045** (2013.01 - EP US); **F03D 13/10** (2016.05 - US); **F03D 13/35** (2016.05 - US); **F03D 17/00** (2016.05 - US); **F05B 2240/3052** (2020.08 - EP US); **F05B 2270/332** (2013.01 - US); **F05B 2270/404** (2013.01 - EP US); **Y02E 10/72** (2013.01 - EP)

Citation (examination)

EP 3436693 B1 20210512 - VESTAS WIND SYS AS [DK]

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)

**EP 3744973 A1 20201202**; **EP 3744973 B1 20231004**; **EP 3744973 C0 20231004**; US 12006916 B2 20240611; US 2020378361 A1 20201203

DOCDB simple family (application)

**EP 19177617 A 20190531**; US 202016888982 A 20200601